Wiring Diagrams

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SAFETY CONSIDERATIONS

Installing, starting up, and servicing this equipment can be hazardous due to system pressures, electrical components, and equipment location.

Only trained, qualified installers and service mechanics should install, start up, and service this equipment.

Untrained personnel can perform basic maintenance functions such as cleaning coils. All other operations should be performed by trained personnel.

When working on the equipment, observe precautions in the literature and on tags, stickers, and labels attached to the equipment. Follow all safety codes. Wear safety glasses and work gloves. Use care in handling, rigging, and setting bulky equipment.

ELECTRIC SHOCK HAZARD

Open all remote disconnects before servicing this equipment.

SAFETY FEATURES

1. On resumption of power after a power failure, the unit will recycle automatically, bringing on the compressor after a period of 6 seconds to 5 minutes has elapsed.
2. To reset the compressor overtemperature protection, high-pressure switch circuit, low-pressure switch circuit, and oil pressure switch (if equipped), turn the ON-OFF switch to OFF, then back to ON position.

IMPORTANT: If a compressor shuts down because the overtemperature protector opens, check for refrigerant leaks, proper unit voltage, and sufficient fluid flow before resetting.

3. The specially calibrated circuit breakers are designed and selected for hermetic refrigeration-duty compressor motors.

⚠ WARNING

Use only designated overload protection.

SEQUENCE OF OPERATION

The 30H units have a multiple-step temperature controller, factory set to maintain capacity control through leaving chilled fluid temperature. The controller has 4 capacity steps. All 30HK, HL units have 4 capacity steps as standard. The 30HW018 and 028-040 units have 3 steps as standard, with a fourth step available as a factory-installed option. The 30HW025 units have 2 steps of capacity as standard with a third step available as a factory-installed option. All units have electric solenoid unloaders.

At initial start-up, assume that all safety devices are satisfied and there is a call for cooling.

30HK, HL Units — Close the compressor circuit breaker and turn the ON-OFF switch to ON position.

In approximately 5 minutes, the lead compressor starts and the unloaders are energized (compressor unloads when compressor unloader solenoid is energized). On 30HL units, the liquid line solenoid valve will remain closed for the first 10 seconds of compressor operation. The low-pressure and oil pressure switches are bypassed for 2 minutes. At the end of the 2-minute bypass period, the low-pressure and oil pressure switches are active in the control circuit.

Approximately 30 seconds (high setting) or 3 minutes (low setting) later, depending on the sample rate setting, the lag compressor starts and the unloaders are energized (compressor unloads when compressor unloader solenoid is energized). On 30HL units, the liquid line solenoid valve will remain closed for the first 10 seconds of compressor operation. The low-pressure and oil-pressure switches are bypassed for 2 minutes. At the end of the 2-minute bypass period, the low-pressure and oil-pressure switches are active in the control circuit.

Approximately 30 seconds (high setting) or 3 minutes (low setting later, depending on the sample rate setting, the lead compressor is loaded (unloader solenoids deenergized).

Manufacturer reserves the right to discontinue, or change at any time, specifications or designs without notice and without incurring obligations.

When the load is satisfied and the leaving fluid temperature falls below the set point, the last stage activated is dropped immediately. If the leaving fluid temperature still remains below the set point, then the control drops an additional stage every 30 (high setting) or 180 (low setting) seconds, depending on the sample rate setting.

Once the compressor is shut-off, the control system prevents the compressor from restarting within 5 minutes of when it was last shut down. Once this period has elapsed and the leaving fluid temperature rises above the set point, the compressor will start within 5 seconds.

If the unit is equipped with field-installed hot gas bypass, the hot gas bypass valve opens only when stage 1 is active.

If the unit trips out on high pressure, low pressure, ground current (accessory), or low oil pressure, the control module locks the unit off and must be manually reset (turn the ON-OFF switch to OFF and then back to ON position). If the unit trips out on low fluid temperature, chilled fluid flow switch or chilled fluid pump switch, it restarts automatically when the condition is corrected.

30HW Units — Close the compressor circuit breaker and move ON-OFF switch to ON position. The switch should light up. In approximately 3 seconds, the compressor starts unloaded. For 2 minutes the low-pressure switch is bypassed and the unloaders are energized (compressor unloads when compressor unloader solenoid is energized). At end of 2-minute bypass period, the low-pressure switch activates in the control circuit and the temperature controller regulates the capacity steps based on leaving cooler fluid temperature, and set point and deadband settings on the temperature controller.

If system load drops to the point where unit is fully unloaded and the fluid temperature is below the lower deadband limit, the compressor shuts off and is not able to restart until the 5-minute anti-short cycle has expired. If during normal operation, the fluid temperature rises above the upper deadband limit, the temperature controller adds a step of capacity (assuming a step is left to be added).

On condenserless units (30HWA), or on fluid-cooled units (30HWB, C, and S) equipped with the accessory oil safety switch, the control module provides a 2-minute bypass of the oil safety switch.

If the unit is equipped with the hot gas bypass option, the hot gas bypass valve closes before unloaders are deactivated

If the unit trips out on high or low pressure, ground current (accessory), or low oil pressure, the control module locks the unit off and must be manually reset (by turning the ON-OFF switch to OFF, then back to ON position). If the unit trips out on low fluid temperature, chilled fluid flow switch, or chilled fluid pump switch, it restarts automatically when the condition is corrected.

LEGEND

A	— Alarm
C	— Contactor, Compressor
CB	— Circuit Breaker
CH	— Crankcase Heater
CM	— Control Module
COM	— Common
COMP	— Compressor
COTP	— Compressor Overtemperature Protection
CR	— Control Relay
CMR	— Control Module Relay
CWFS	— Chilled Water (Fluid) Flow Switch
CWP	— Chilled Water (Fluid) Pump Interlock
D	— Discharge
DLS	— Demand Limit Switch
EQUIP	— Equipment
GCS	— Ground Current Sensor
GND	— Ground
HGB	— Hot Gas Bypass
HGS	— Hot Gas Solenoid
HPS	— High Pressure Switch
ILC	— Condenser Interlock
J	— Jumper
L	— Light
LLSV	— Liquid Line Solenoid Valve
LPS	— Low-Pressure Switch
N	— Neutral
NC	— Normally Closed
NEUT	— Neutral Wire Lug
NO	— Normally Open
OPS	— Oil-Pressure Switch
PL	— Plug
R	— Relay
SEC	— Seconds
SW	— Switch
T	— Thermistor
TB	— Terminal Block
TC	— Temperature Control
TDR	— Time Delay Relay
THERM	— Thermistor
TOR	— Toroid
TRAN	— Transformer
TSW	— Thermistor Switch
U	— Unloader
x	— Terminal Block
	— Terminal (unmarked)
x	— Terminal (marked)
	— Splice
	— Factory Wiring
	— Field Wiring
	— Accessory or Option Wiring
	— To indicate Common Potential Only, Not to Represent Wiring

NOTES

1. Factory wiring is in accordance with the National Electrical Code (U.S.A.). Any field modifications or additions must be in compliance with all applicable codes.
2. Field-installed power wires must be rated 75 C minimum.
3. All circuit breaker must-trip amps are equal to or less than 156% rated load amps.
4. Schematic (Fig. 3 and 7 shows controller in fully loaded position. Compressor unloads when compressor unloader solenoid is energized.
5. Oil pressure safety switch is standard on 30HL and 30HWA and 30HW brine duty units only.
6. All field interlock contacts must have a minimum rating of 2 amps at 24 vac sealed. See field interlock wiring.
7. Compressors are thermally protected. Three-phase motors are protected against primary single-phasing conditions.
8. On 30HW units, connect yellow wire to (H2) for 208, 346, and 575 v; to (H3) for 230, 380, and 400 v; to (H4) for 460 v.
9. When installing GSC's CWPS, CWP, DLS or remote ON/OFF switch factory jumpers must be removed, refer to unit label diagram for more detail.

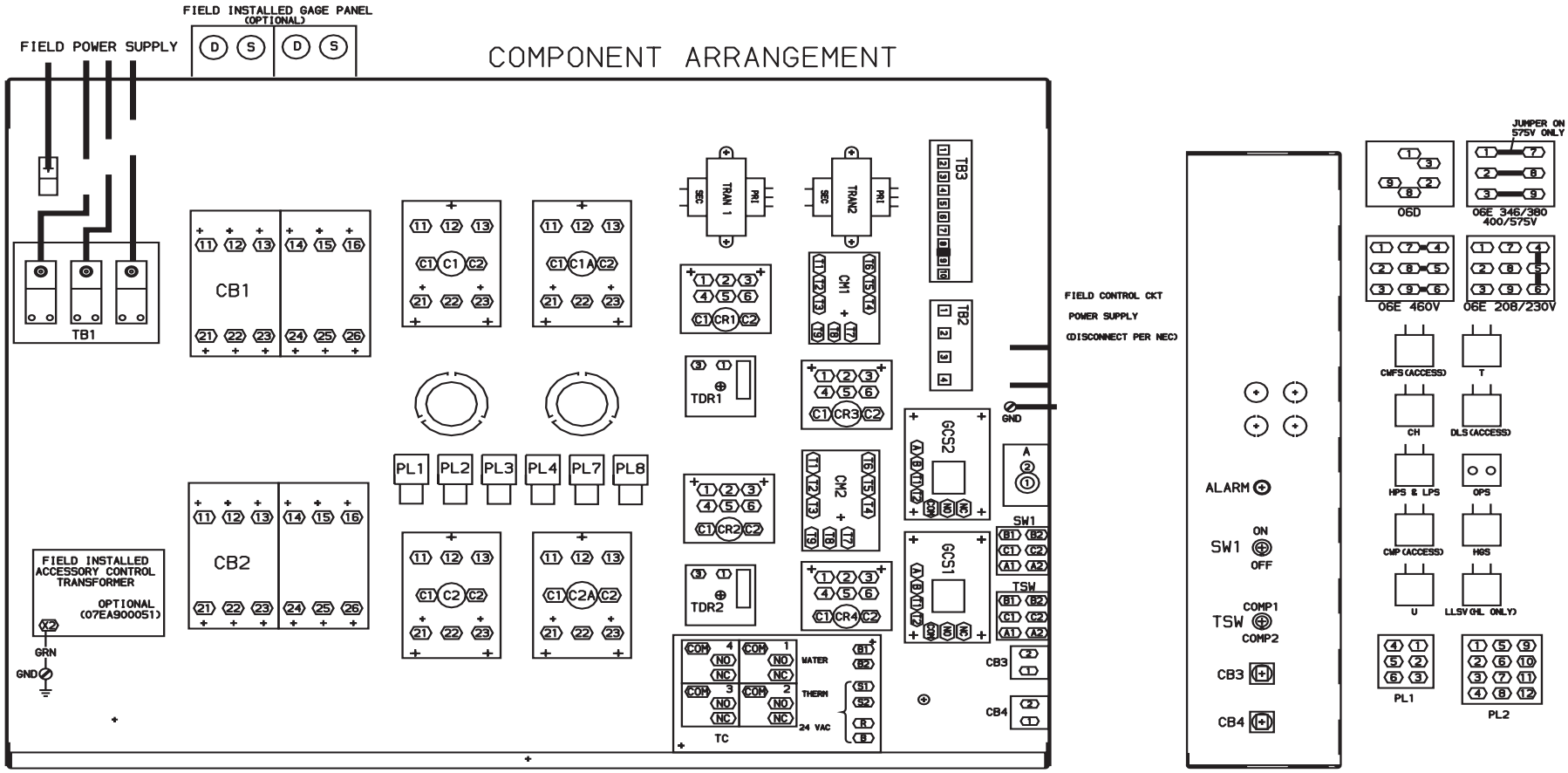


Fig. 1 — Component Arrangement; 30HK,HL Units

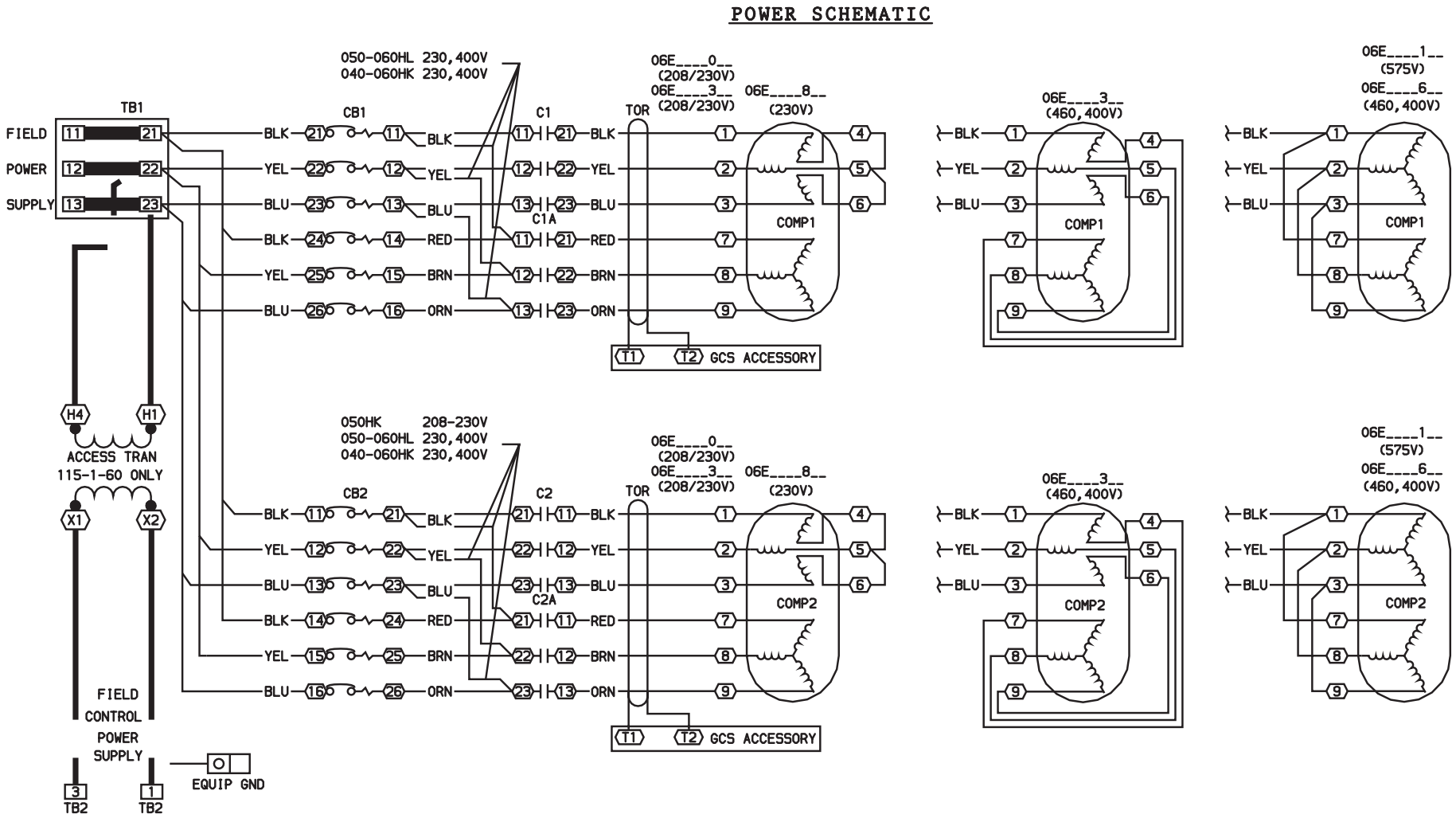


Fig. 2 — Power Schematic; 30HK,HL

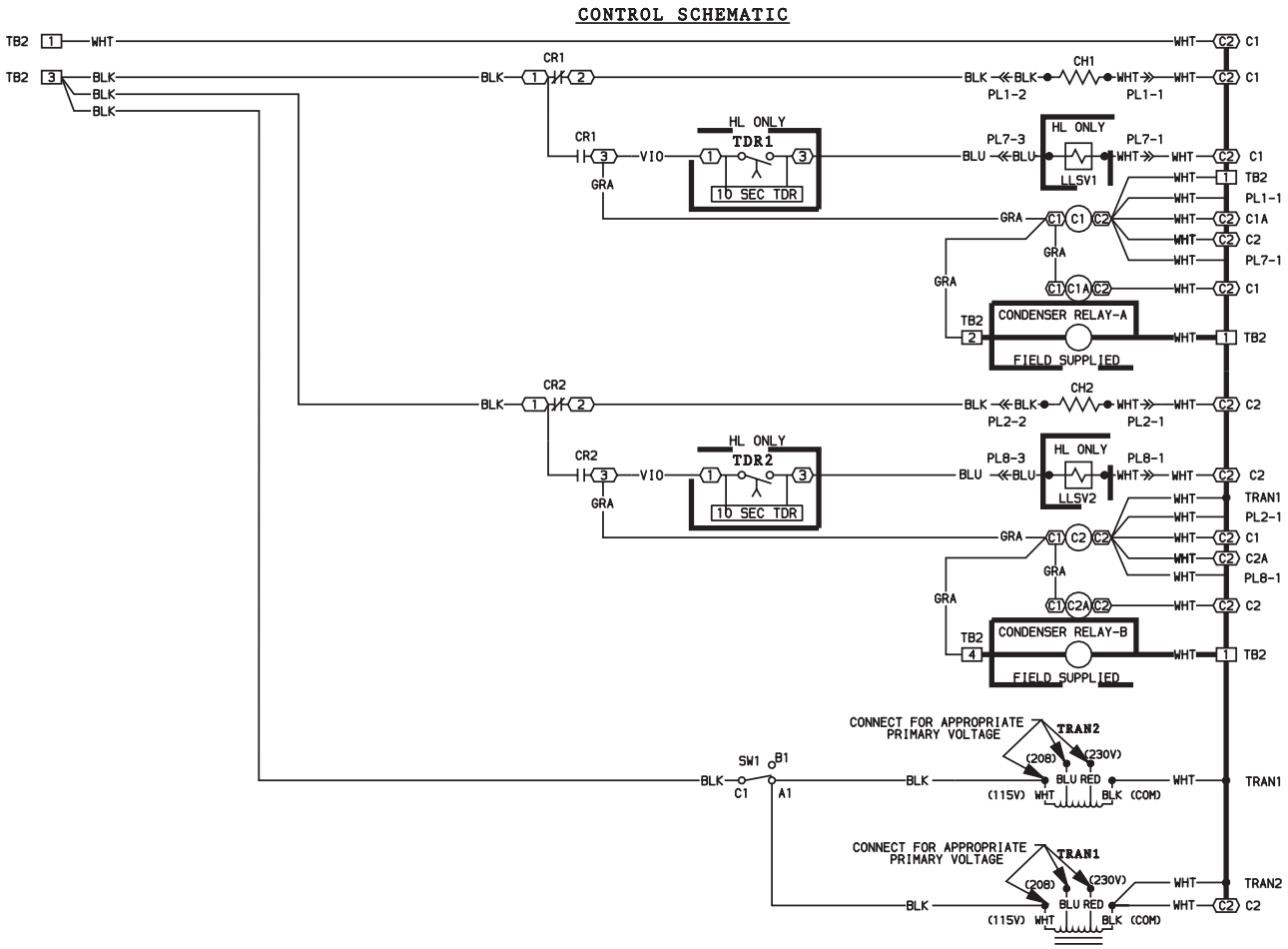


Fig. 3 — Control Schematic; 30HK,HL Units

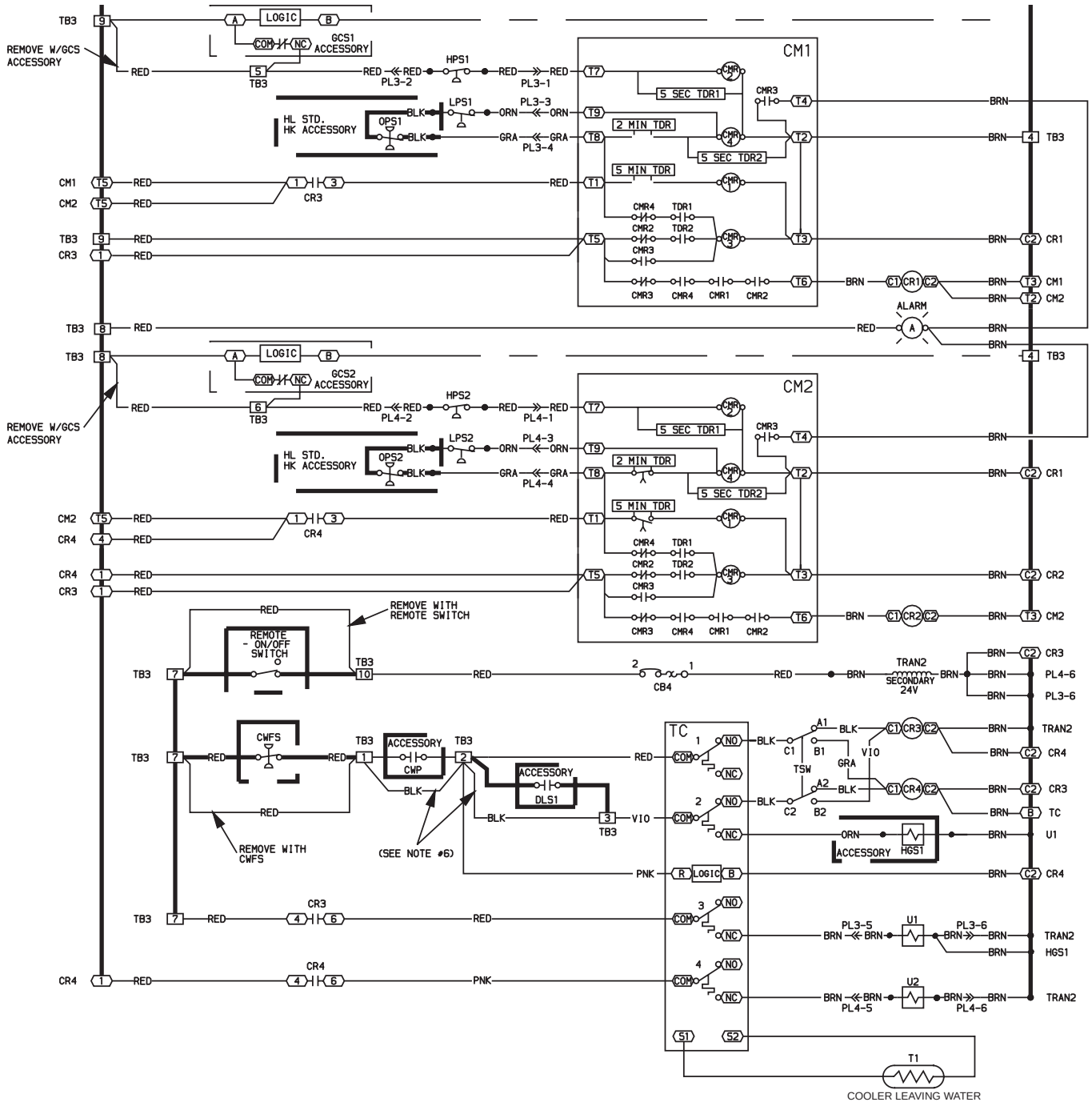
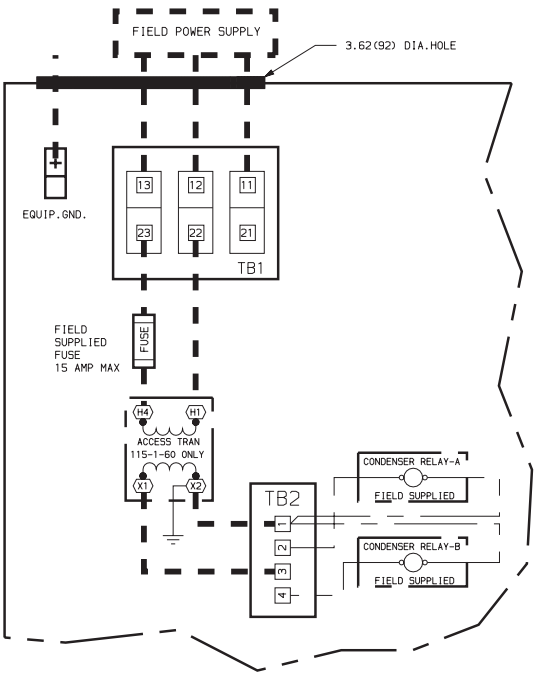
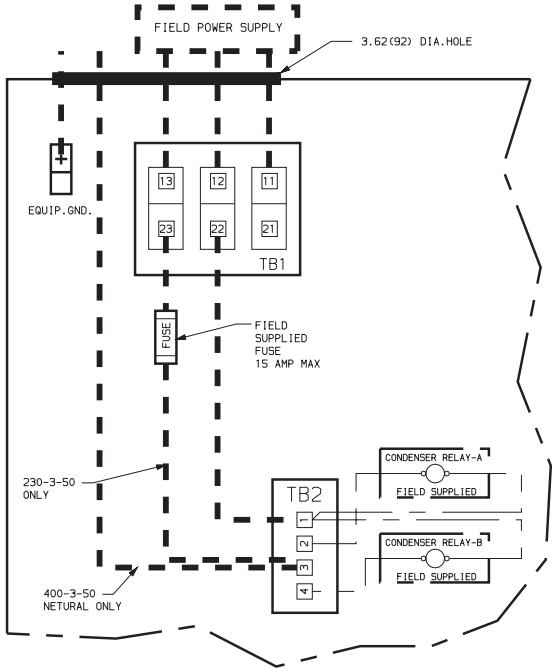


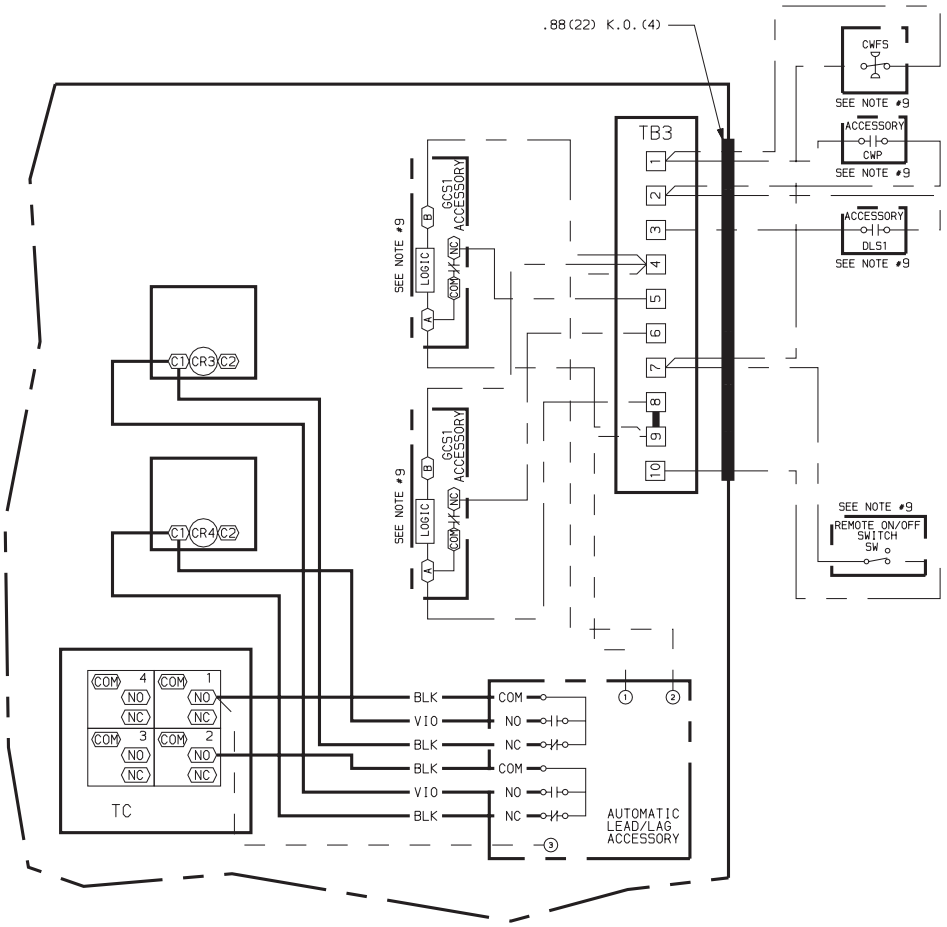
Fig. 3 — Control Schematic; 30HK,HL Units (cont)



FIELD POWER WIRING, 50 Hz UNITS
w/ACCESSORY TRANSFORMER



FIELD CONTROL WIRING, 50 Hz UNITS



FIELD ACCESSORY WIRING

Fig. 4 — Field Wiring Diagram; 30HK,HL Units

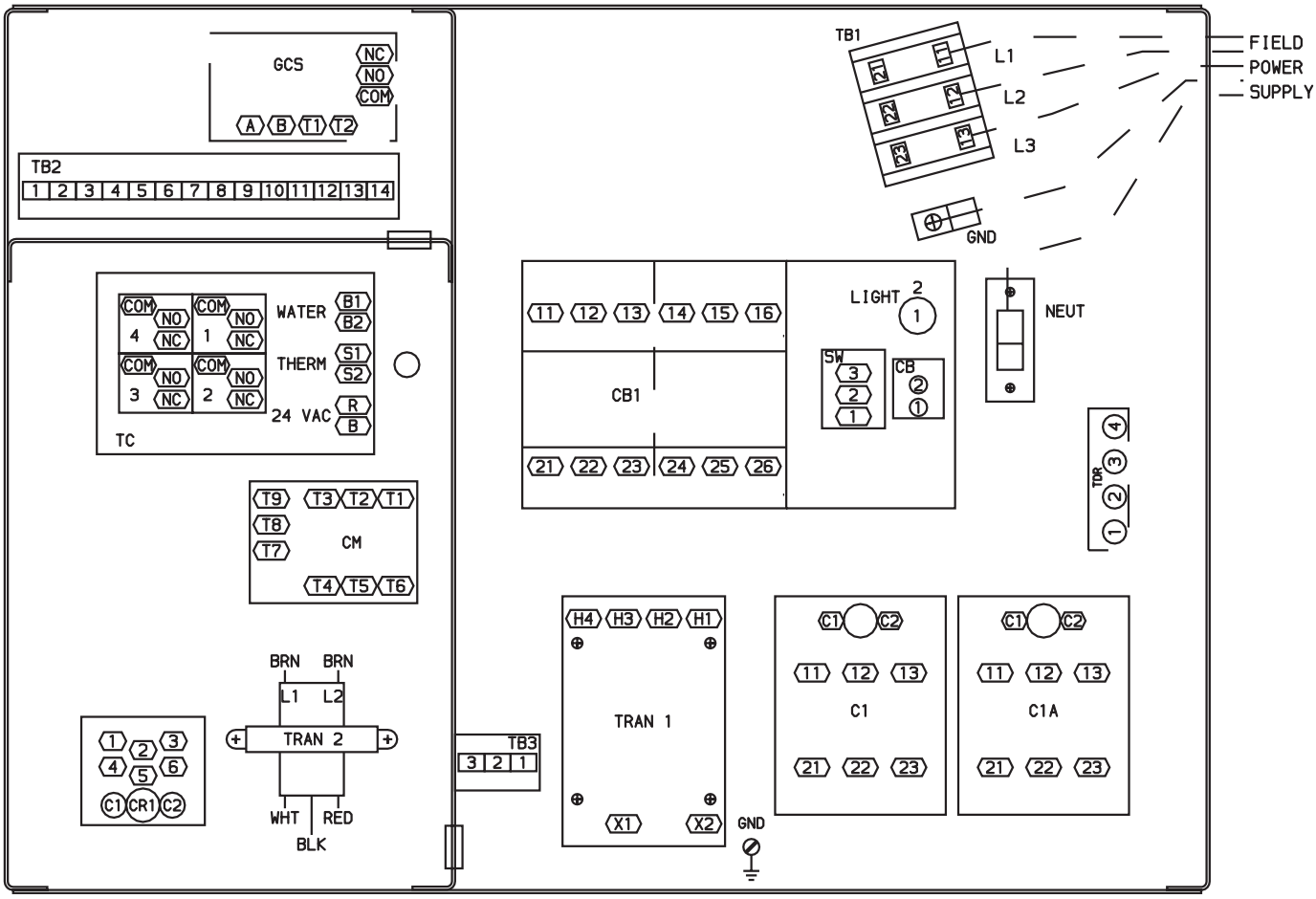


Fig. 5 — Component Arrangement; 30HW Units

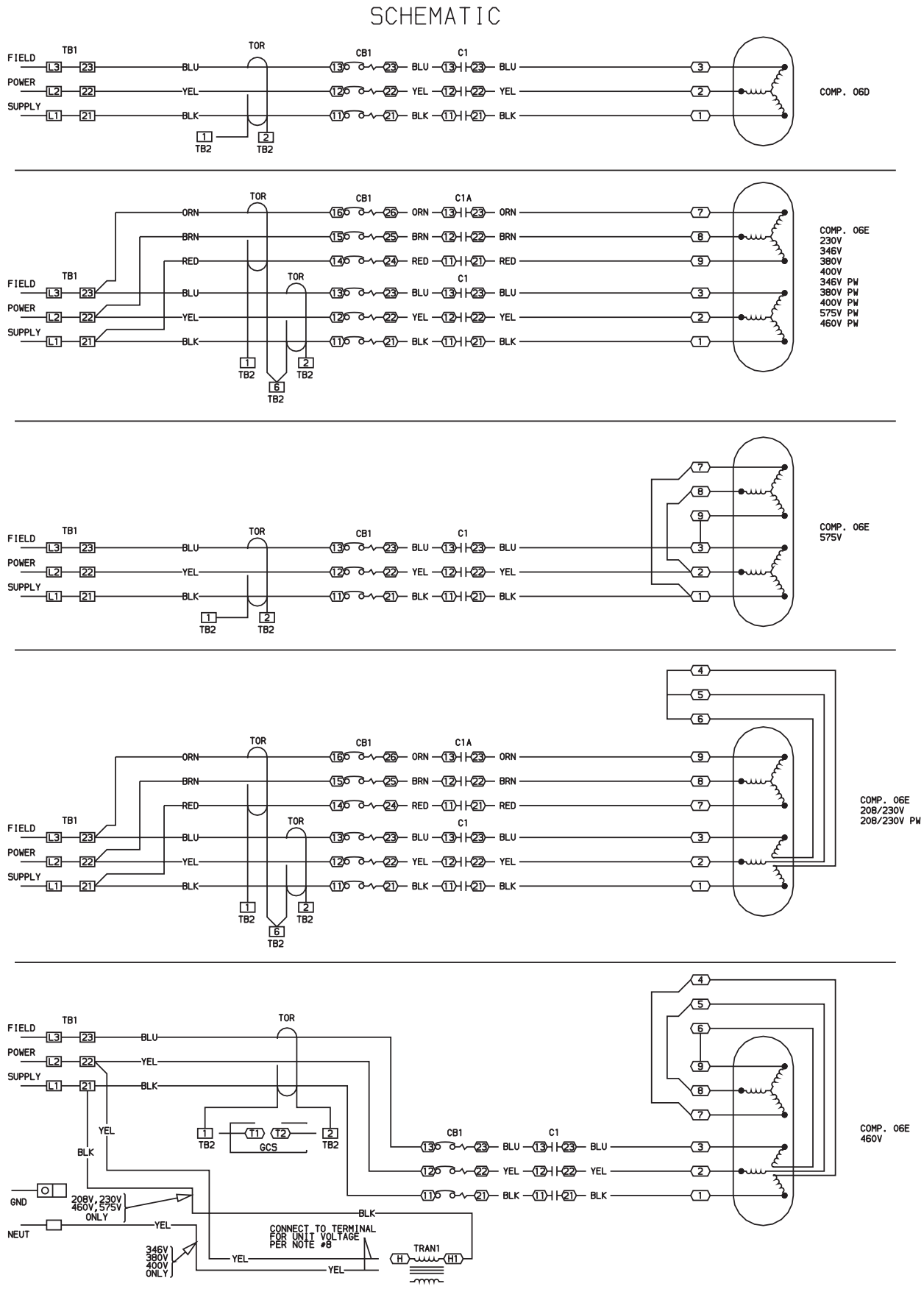


Fig. 6 — Power Schematic; 30HW Units

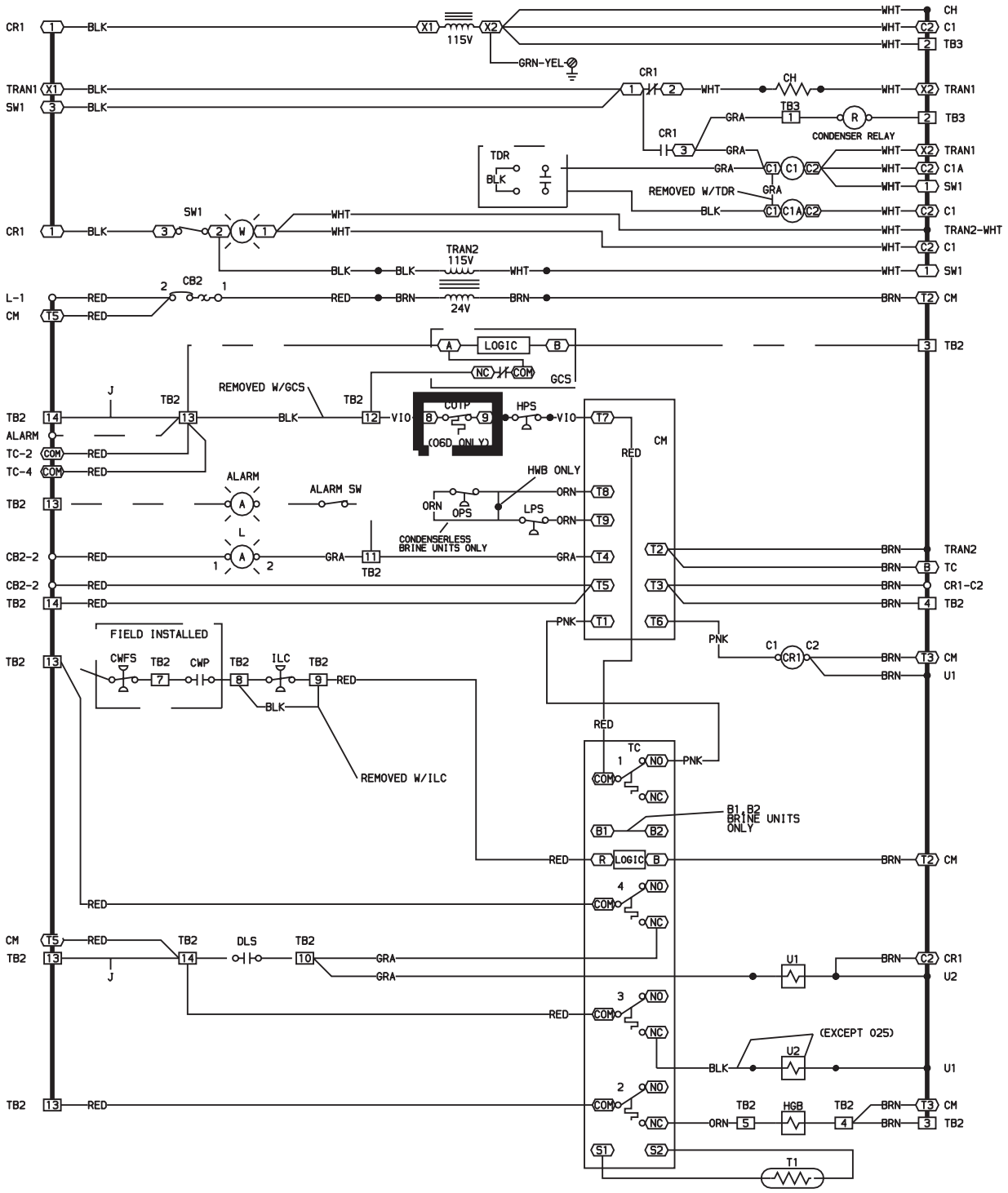


Fig. 7 — Control Schematic; 30HW Units

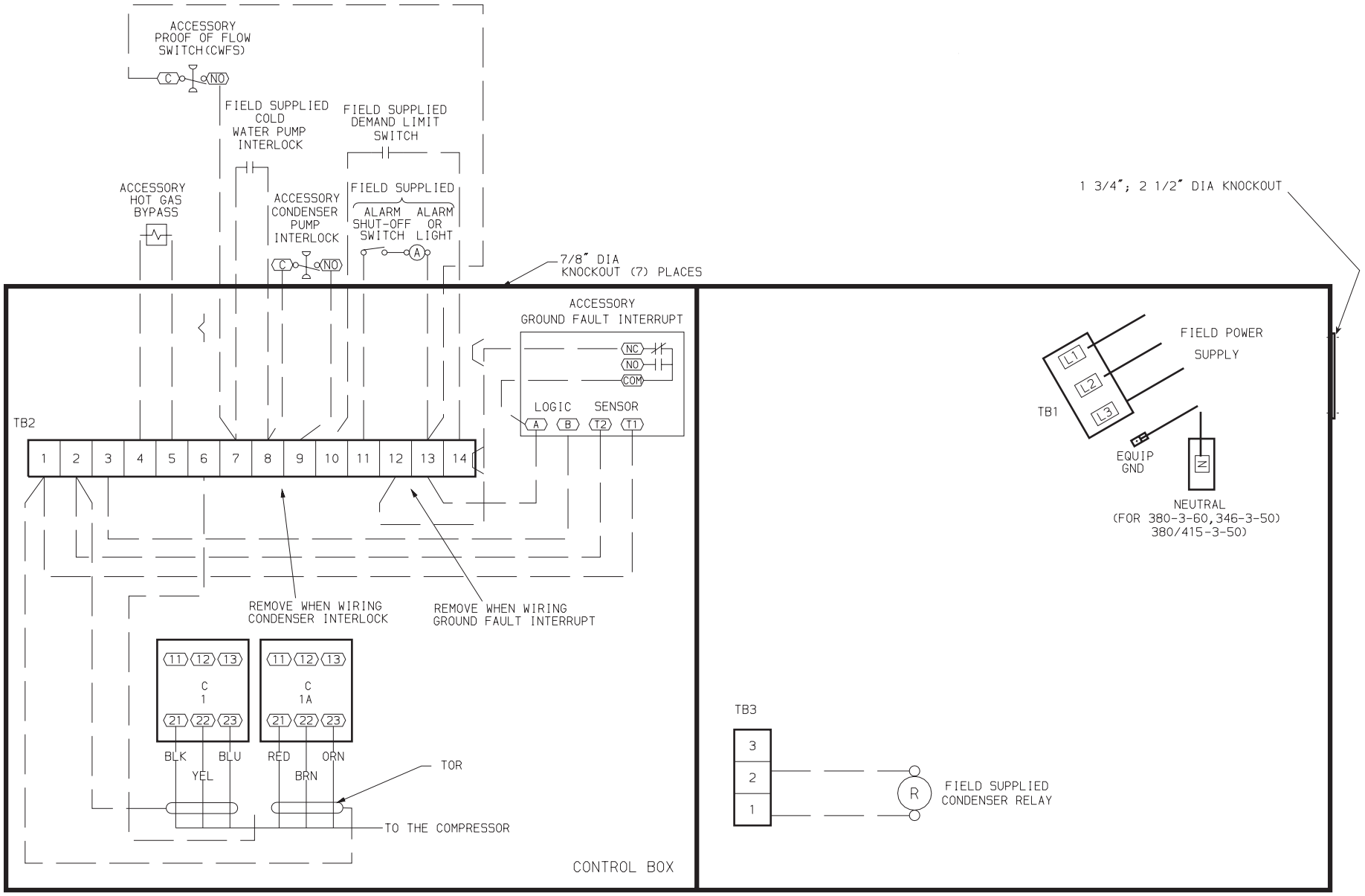


Fig. 8 — Control Schematic; 30HW Units

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